RAYTHEON COMPANY
SEMICONDUCTOR DIVISION

350 ELLIS STREET
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MOUNTAIN VIEW, CA 94039-7016

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April 4, 1985

Thomas J. Berkins
San Francisco Bay Regional Water
Quality Control Board
1111 Jackson Street, Room 6040
Oakland, CA 94607

Re: Raytheon Semiconductor Divison
350 Ellis Street
Mountain View, CA 94039

Dear Mr. Berkins:

As you are aware, traces of various hazardous wastes have been detected in the subsurface soils and groundwater of the 350 Ellis Street facility of the Raytheon Semiconductor Division as a result of various soil gas, groundwater, and subsurface soil investigations performed by the division. In an effort to determine possible sources of such pollutants, the division has undertaken an investigation of historical waste handling activities at the 350 Ellis Street facility since Raytheon's purchase of the facility from Rheem Semiconductor Corporation in or about 1961. As a result of that investigation, it now appears that various activities at the facility, dating back to the inception of the facility, may have resulted in the release of various wastes at the site.

The existence of contamination in this general area is well known and has, in part, been identified by various tests conducted by the Company and others. The attached report is being provided to supplement information previously given to the Regional Water Quality Control Board and other governmental agencies.

Very truly yours,

RAYTHEON COMPANY

By Michael G. Rosa
Michael G. Rosa
Director, Manufacturing Services
Raytheon Semiconductor Division

2189. 8107

RAYTHEON SEMICONDUCTOR DIVISION

REPORT OF HISTORICAL CHEMICAL WASTE HANDLING ACTIVITIES

350 ELLIS STREET FACILITY

A. Site Description

Raytheon Semiconductor Division's 350 Ellis Street facility is comprised of a manufacturing and office building (Building 3), a chemical storage shed (Chemical Storage Shed), a supplies shed (Supplies Shed), a plating shop (Plating Shop), a chemical lab and office building (Chemical Lab), a recorus storage building (Records Storage Building), and a maintenance shed (Maintenance Shed).

1. Building 3. Building 3 contains approximately 53,000 square feat of semiconductor fabrication and manufacturing space and 52,000 square feet of general office and administrative space. The Semiconductor Division first occupied Building 3 in or about November 1961. Prior to that time the building was owned and occupied by Rheem Semiconductor Corporation.

a. Acid Waste Containment Facilities. Since the division first occupied Building 3, non-organic acid wastes generated in the course of manufacturing processes within Building 3 have been flushed with water through designated acid drains via a segregated piping system to plant acid neutralization systems, where such wastes are neutralized prior to release to the City of Mountain View sewer. Such wastes are currently neutralized at the South and Northwest Neutralization Systems.

b. Solvent Waste Containment Facilities. Beginning in approximately 1966 or 1967, the division installed a solvent waste containment system whereby organic solvent wastes, spent photoresist, and spent metal and photo stripper generated within Modules 1 and 2 of Building 3 have been aspirated at work stations to the South Holding Tank through segregated, exposed piping systems. Beginning in approximately 1971, organic solvent wastes, spent photo-resist, and spent metal and photo-stripper generated within Module 3 of Building 3 have similarly been aspirated at work stations to the West Holding Tank through a segregated, exposed solvent waste piping system. Both holding tanks have secondary containment. The West Holding Tank is recessed partially below grade in a concrete vault. From the holding tanks, said wastes are pumped through exposed, above-ground pipes to a solvent containment tanker where the wastes are collected and contained for offsite disposal at a Class I disposal site.

2. Chemical Storage Shed. The Chemical Storage Shed is utilized for storage of bulk chemicals only. No chemical wastes are known or believed to be generated or disposed from this location except possibly as a result of minor, inadvertent spills in the course of materials handling and transfer.

3. Supplies Shed. The Supplies Shed is utilized for the storage of industrial supplies only. No chemical wastes are known or believed to be generated or disposed from this location.

4. Plating Shop. The Plating Shop occupies approximately 8,000 square feet and is utilized for precious metal plating, electro-tin plating, lead plating, stripping and degreasing of finished semiconductor devices, and reclamation of precious metals. Non-organic acid wastes generated within the Plating Shop are flushed with water into designated acid drains and through a segregated piping system to the Northwest Neutralization System, where such wastes are neutralized prior to release to the City of Mountain View sewer.

Since at least 1979, organic solvent wastes and spent metal stripper generated within the Plating Shop have been collected within portable containers and transported to above-ground containment tanks (Plating Shop Containment Tanks) along the exterior of the Plating Shop where such wastes are collected and contained for offsite disposal at a Class I disposal site.

5. Chemical Lab. The Chemical Lab is used for chemical plating analysis, general non-chemical storage, and office space. Small amounts of chemical wastes are removed from this location in containers and disposed of in plant acid neutralization systems or above-ground waste containment tanks.

6. Records Storage Building. The Records Storage Building houses records of the division and surplus equipment; no chemical wastes are known or believed to be generated or disposed from this location.

7. Maintenance Storage Shed. The Maintenance Storage Shed is attached to the Records Storage Building and houses building maintenance supplies. No chemical wastes are known or believed to be generated or disposed from this location.

B. Past Waste Handling Activities

Following the detection and confirmation of various contaminants in subsurface soils and groundwater on and about the 350 Ellis Street site, an investigation of past waste handling activities at the facility was undertaken. Because detailed, accurate records of such activities prior to 1980 are either unavailable or incomplete, the investigation has centered primarily upon the recollections of current employees. In conducting the investigation, Raytheon has endeavored to contact those individuals currently available to it who are most likely to be knowledgeable with respect to past chemical waste handling activities at the facility. There may, however, be additional individuals who have not yet been contacted who are knowledgeable with respect to such activities. Accordingly, the following summary of past activities may not be complete. Moreover, in many cases those individuals who have been contacted have been

asked to recall activities dating back to the early 1960s, both before and after the division acquired the facility from Rheem Semiconductor Corporation in 1961. Because the recollections of these individuals are often incomplete, sketchy, or in conflict with the recollections of co-workers, a definitive description of past activities cannot be presented. What follows, however, is a summary of the information gathered to date.

1. Acid Waste Containment System. In addition to occasional minor leaks in the acid neutralization piping system which have been promptly repaired by the division's facilities staff following detection, a subsurface break in the 4 inch acid waste pipeline running from Building 3 to the Northwest Neutralization System was detected in or about 1979 or 1980. When detected, a volume of process waste water estimated to be flowing at approximately twice the flow rate of an ordinary garden hose was observed to be spilling into a subterranean cavity. Manufacturing operations supplying the pipeline were immediately suspended, the pipeline was repaired, and the cavity was filled with sand. No water or soil samples are known or believed to have been taken from the pipe or the cavity at the time of the break. The duration of the break is not known. Wastes believed to have been drained to the pipeline at or about the time of the break include process water (believed to constitute in excess of 50% of all wastes passed to the pipeline), acetic acid, ammonium fluoride, buffered oxide etch, hydrochloric acid, hydrofluoric acid, nitric acid, and sulphuric acid.

In approximately 1980 or 1981, a leak in an above-ground pipeline leading from the Plating Shop to the Northwest Acid Neutralization System was detected and repaired. In repairing the pipe, a bluish coagulated substance was reportedly removed from the pipeline.

Prior to the installation of the Northwest Acid Neutralization System in approximately 1968 or 1969, the West Holding Tank and one other below-grade double-contained holding tank adjacent to the Plating Shop (Plating Shop Holding Tank) were utilized as the acid neutralization system for Module 3 of Building 3 and the Plating Shop. When the Northwest Acid Neutralization System was placed in service in approximately 1968 or 1969, both the West Holding Tank and the Plating Shop Holding Tank were drained and taken out of service. In the course of this process, the polypropylene tank in the West Holding Tank was found to be leaking, and a hole of approximately 2 inches in diameter was found in the concrete vault in which the tank sat. The tank was discarded, the hole in the vault was patched, and the West Holding Tank was removed from service for approximately 2 to 3 years. Thereafter, in approximately 1971, the West Holding Tank was converted to use as a solvent holding tank for Module 3.

2. Solvent Waste Containment System. In addition to occasional minor leaks in the waste solvent piping system which

have been promptly repaired by the division's facilities staff following detection, a leak in the pipeline connecting the West Holding Tank with the Containment Tanker occurred in approximately 1980 and resulted in a spill of approximately 1 to 2 gallons of solvent waste to ground. It is not known what waste solvent may have been spilled, but the pipeline is believed to have transported trichloroethane (tradename VG), isopropyl alcohol, methyl alcohol, methyl ethyl ketone, J-100 stripper, and A-30 stripper.

In or about the mid-1970s, a visual inspection of the West Holding Tank revealed a split in the polypropylene tank within the vault. The tank was promptly replaced. Approximately 4 to 5 gallons of liquid waste were observed in the vault, but the liquid appeared to be contained and no hole or deterioration in the vault was detected.

3. Past Waste Disposal Activities at Building 3. Prior to completion of the installation of the solvent waste containment system in Building 3 in approximately 1970 or 1971, various solvent wastes generated within Building 3, including trichloroethylene ("TCE"), freon, spent photo-resist (believed to contain xylene), J-100 stripper, methyl ethyl ketone, acetone, and methyl alcohol, may have been passed to the acid neutralization systems or released to ground. In addition to the foregoing, microgrit slurry (believed to contain silicon dust, pella oil, alumina grit, and TCE residue, some of which may not be hazardous), various acidics or caustics, including boron tribromide (BBR_3), phosphorous oxychloride ($POCl_3$), silicon tetrachloride, ethylene glycol, arsenic trichloride, nitric acid, sulphuric acid and hydrochloric acid, and various lubricants, including Welsh 1407K oil, may have been passed to the acid neutralization systems or released to ground for an unknown period of time. The total volume of wastes released in this manner is not known, nor can it be determined with reasonable certainty exactly where or when such releases may have occurred. Releases to ground of the above waste materials reportedly occurred in the vicinity of the Chemical Storage Shed, the Supplies Shed, and the Plating Shop.

4. Past Waste Disposal Activities at Plating Shop. Prior to installation of the first solvent waste containment tank for the Plating Shop, various solvent wastes generated within the Plating Shop, including TCE, tin stripper (tradename EN-strip TL), and methyl alcohol may have been passed to the Northwest Acid Neutralization System or released to ground. The total volume of wastes disposed in this manner is not known, nor can it be determined with reasonable certainty exactly where or when such releases may have occurred. Releases to ground of the above waste materials reportedly occurred north and/or west of the Plating Shop. In addition to the foregoing, a heavy metal (mercury) in a quantity believed to be less than 400 cc per year is reported to have been released to ground west and/or south of the Plating Shop for an unknown period of time.

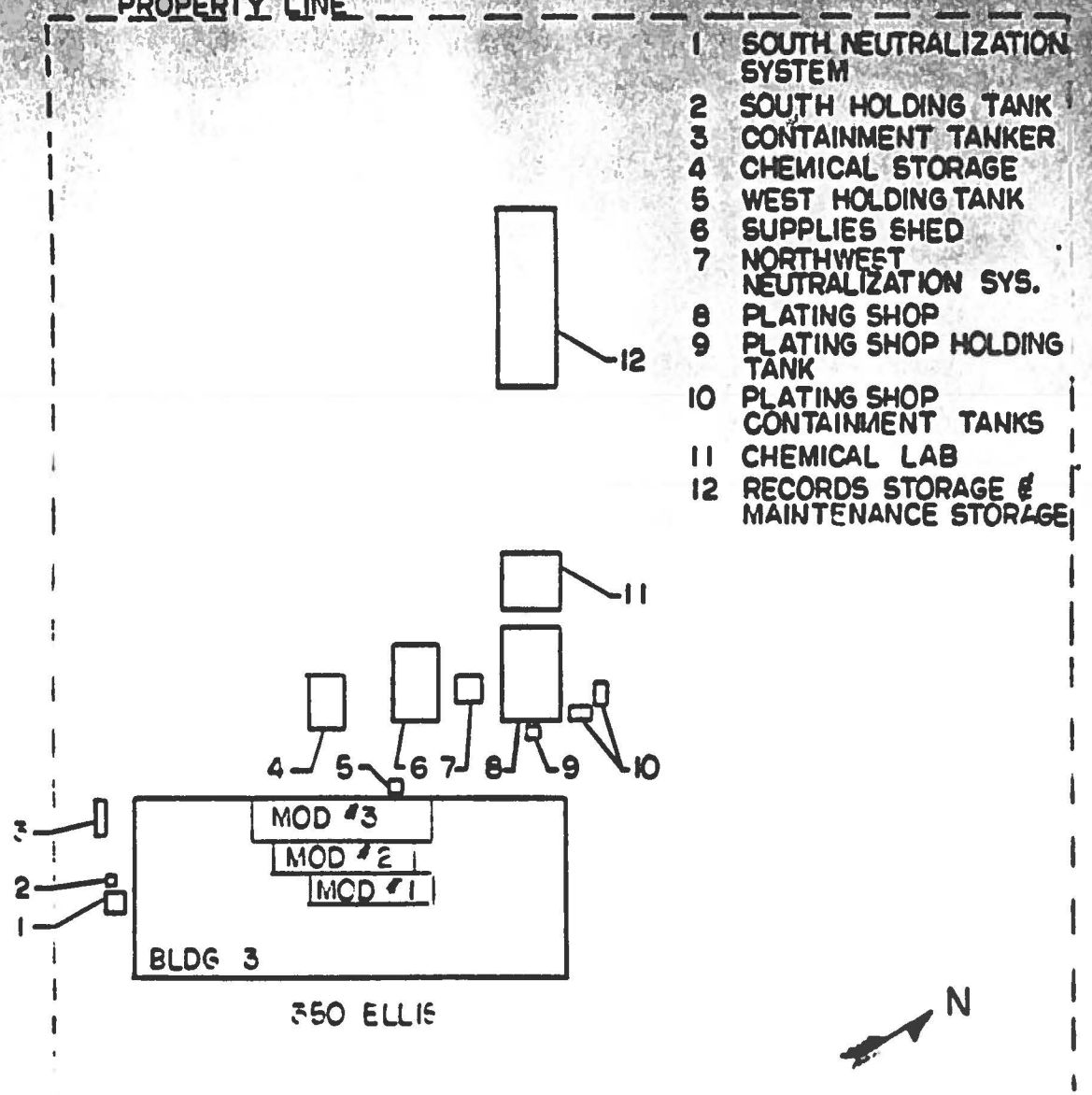
PROPERTY LINE
1 SOUTH NEUTRALIZATION SYSTEM
2 SOUTH HOLDING TANK
3 CONTAINMENT TANKER
4 CHEMICAL STORAGE
5 WEST HOLDING TANK
6 SUPPLIES SHED
7 NORTHWEST NEUTRALIZATION SYS.
8 PLATING SHOP
9 PLATING SHOP HOLDING TANK
10 PLATING SHOP CONTAINMENT TANKS
11 CHEMICAL LAB
12 RECORDS STORAGE & MAINTENANCE STORAGE
12
11
4
5
6
7
8
9
10
3
2
1
MOD #3
MOD #2
MOD #1
BLDG 3
350 ELLIS
N
ELLIS ST.

PLATE 1